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EXAMINER

SILVER, DAVID

ART UNIT

PAPER NUMBER

2128

DATE MAILED: 11/30/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/007,816	Applicant(s) FRANKEL ET AL.	
	Examiner David Silver	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 10, 11, 13-25 and 27-37 is/are pending in the application.
4a) Of the above claim(s) 7-9, 12, 26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 10, 11, 13-25 and 27-37 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/25/05, 10/17/05</u> | 6) <input type="checkbox"/> Other: ____ |

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DETAILED ACTION

1. Claims 1-37 are pending in Instant Application filed 11/9/01.
2. This action is in response to Applicant's Amendments & Remarks entered 10/24/05.
3. Applicant cancelled claims 7-9, 12, and 26.
4. Claims 1-6, 10-11, 13-25, and 27-37 were presented for reconsideration.

Response to Arguments

5. Applicant's arguments filed 10/24/05 have been fully considered but they are not persuasive.
6. **Regarding claims 1-6, 10-11, 20-25, 27-37:**

Regarding claims 1-5, 20-24, and 31-37 Applicants argue primarily:

Damani et al, "Fault-Tolerant Distributed Simulation" ("Damani") does not teach or suggest the amended claim limitation "at least one logging node of the plurality of nodes is configured to log the message packets in one or more log files on at least one non-volatile storage medium during the simulation, wherein the at least one logging node is separate from nodes targeted by the message packets."

The Examiner respectfully traverses Applicant's arguments.

The limitation "one or more log files on at least one non-volatile storage medium" is taught at section 2 paragraph 2 lines 1-5. Emphasis on "stable storage".

The limitation "wherein the at least one logging node is separate from nodes targeted by the message packets" is taught at **(Abstract last 4 lines)**. With emphasis on "clusters". The Examiner asserts that the Damani's invention allows for clustering of message logging nodes and therefore has at least two nodes that are separate from other nodes target by message packets.

As per claims 20 and 31, note the rejection of claim 1 above. The Instant claims are functionally equivalent to the above-rejected claim and are therefore rejected under same prior-art teachings. Therefore, the Examiner maintains all rejections of claims 1-5, 20-24, 31-37 where the prior art used is Damani, or Damani in further view of Smallmo US Patent 6,289,398 ("Smallmo").

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7. Regarding claims 1, 6, 10-11, 20-21, 25, 27-30 Applicants argue primarily:

Additionally, Applicants argue:

The Office Action also asserts that Ulrich teaches the features of claim 1. Specifically, the Office Action asserts that Ulrich's storing of message packets in memory for access by the CPU comprises message logging. Applicants respectfully disagree.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Applicants Argue that:

Furthermore, Applicants submit that Ulrich's storing of messages in memory does not teach or suggest "log the message packets in one or more log files on at least one non-volatile storage medium" as recited in claim 1.

The Examiner respectfully traverses this argument. Specifically, the Examiner draws Applicants' attention to **(col.: 4 lines: 62-65; col 4 lines 28-29)**

Applicants argue that:

Furthermore, Ulrich's "nodes" are exercise machines, and the "simulation" of Ulrich is related to providing a simulated environment for the users of the exercise machines. This has nothing to do with simulating a system under test, as recited in claim 1.

In response to applicant's argument that simulation of a system under test, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. Furthermore, the Examiner draws Applicants' attention to Instant Application's specification page 4 lines 8-9 which define "system under test" to be an electronic system being simulated which is also additionally met by Ulrich on **(col.: 7 lines: 24-35 electronic system ... pedal / breaking device)**.

8. Applicants' arguments are therefore found unpersuasive.

9. Applicant's arguments with respect to claims 21, 29, 30 have been considered but are moot in view of the new ground(s) of rejection.

10. Regarding claims 13-19:

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11. Applicant's arguments with respect to claims 13-19 have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendments and claim clarifications.

Response to Claim Objection

12. Applicant's arguments with respect to claim 19 have been considered but are moot in view of the new ground(s) of rejection caused by claim amendments.

Response to 101 Rejections

13. The Examiner thanks the Applicant for fixing issues relating to the 35 USC 101 rejections. Therefore, the Examiner withdraws the 35 USC 101 rejections for claims 1-19 and 31-37.

Response to IDS statement

14. The Examiner thanks the Applicant for supplying the non-patent literature. The Examiner has considered the supplied literature.

Information Disclosure Statement

15. The information disclosure statement (IDS) submitted on Oct 17 05, Jul 25 05 was filed after the mailing date of the non-final office action on 7/19/05. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the Examiner.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

17. Claims 1, 20 and 31 are rejected under 35 U.S.C. 102(b) as being anticipated by Damani et al.

As per claim 1, Damani discloses distributed simulation system comprising:

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two or more computer systems configured as a plurality of nodes arranged to perform a simulation of a system under test (**section 1, paragraph 1, lines 1-5**), wherein the plurality of nodes are configured to communicate simulation commands and signal values for the system under test using message packets transmitted between the plurality of nodes (**section 3, lines 4-6**), and at least one logging node of the plurality of nodes is configured to log the message packets in one or more log files on at least one non-volatile storage medium during the simulation (**section 2, paragraph 2, lines 1-5**), wherein the at least one logging node is separate from nodes targeted by the message packets (**Abstract last 4 lines**).

As per claims 20 and 31 note the rejection of claim 1 above. The Instant claims are functionally equivalent to the above-rejected claims and are therefore rejected under same prior-art teachings.

18. Claims 1, 6, 10-11, 20, 25, 27-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Ulrich et al (US Patent 5,466,200).

As per claim 1, Ulrich discloses a distributed simulation system comprising:

two or more computer systems configured as a plurality of nodes arranged to perform a simulation of a system under test (**column 2, lines 8-15 and lines 26-30**), wherein the plurality of nodes are configured to communicate simulation commands and signal values for the system under test using message packets transmitted between the plurality of nodes (**column 2: lines 8-15 and lines 26-30, column 10: lines 26-29**), and at least one logging node of the plurality of nodes is configured to log the message packets in one or more log files on at least one non-volatile storage medium during the

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simulation (**column 3: lines 45-49, column 8: lines 27-28; col.: 4 lines: 62-65; col 4 lines 28-29**),

wherein the at least one logging node is separate from nodes targeted by the message packets (**Figure 8 and 9**).

As per claim 6, Ulrich discloses a distributed simulation system as recited in claim 1 wherein

the logging node is a hub of the distributed simulation system (**column 3: lines 45-49, column 8: lines 27**).

According to Ulrich's disclosure the log file resides on a computer storage medium such as disclosed on (**col.: 4 lines: 62-65; col 4 lines 28-29**), which is also included in the hub. Thus, when the hub mentioned by Ulrich sends information to –or– receives information from other nodes, the hub writes the information to medium and hence is using a log file. Therefore, the hub of the distributed simulation system is logging the message packets.

As per claim 10, Ulrich discloses a distributed simulation system as recited in claim 1 wherein

the logging node is a distributed control node (**column 8, lines 27-28; col.: 4 lines: 62-65; col 4 lines 28-29**).

As per claim 11, Ulrich discloses a distributed simulation system as recited in claim 10 wherein

one of the plurality of nodes is a hub, and wherein (**column 3, lines 45-57; column 3, lines 50-53**).

the hub is configured to route message packets to the distributed control node even if the message packets are not otherwise destined for the distributed control node (**column 3, lines 45-50; column 8, lines 27-28**).

As per claims 20, 31, note the rejection of claim 1 above. The Instant claims are functionally equivalent to the above-rejected claim and are therefore rejected under same prior-art teachings.

As per claims 25, note the rejection of claim 6 above. The Instant claim is functionally equivalent to the above-rejected claim and is therefore rejected under same prior-art teachings.

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As per claims 27-28, note the rejection of claims 10-11 above. The Instant claims are functionally equivalent to the above-rejected claims and are therefore rejected under same prior-art teachings.

19. Claims 13-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Preiss's "The Yaddes Distributed Discrete Event Simulation Specification Language and Execution Environments", ("Preiss").

As per claim 13, Preiss discloses an apparatus comprising:

a first node configured to simulate a portion of a system under test (**page 5 "model"**);
and
at least one computer readable medium storing instructions which (**page 22 "executed"**), when executed,
read first message packets from a log file, wherein the first message packets were transmitted to a previous node simulating the portion in a preceding simulation, and wherein the instructions (**page 11 "model ReadFromFile"**), when executed,
transmit the first message packets to the first node during the simulation (**page 11 emphasis on "OUTPUT"**), and wherein the instructions, when executed,
read second message packets from the log file, wherein the second message packets were sourced by the previous node simulating the portion in the preceding simulation (**page 12 "model WriteToFile"**), and wherein the instructions, when executed,
verify that the first node sources corresponding message packets during the simulation (**page 10, emphasis on "tmp != \$state->output"**).

As per claim 14, Preiss discloses an apparatus as recited in claim 13 wherein the log file contains only the first message packets and the second message packets (**page 11 "model ReadFromFile" specifically, the model only outputs and inputs the content it has written therefore it complies with the limitation**).

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As per claim 15, Preiss discloses an apparatus as recited in claim 13 wherein the log file contains each message packet transmitted in the preceding simulation **(page 11 "model ReadFromFile" specifically, the model only outputs and inputs the content it has written therefore it complies with the limitation).**

As per claim 16, Preiss discloses an apparatus as recited in claim 15 wherein the instructions, when executed, ignore message packets other than the first message packets and the second message packets in the log file **(page 11 "model ReadFromFile" because only the first and the second message packets exist in the log file the disclosed system fully complies with the claim limitation).**

As per claim 17, Preiss discloses an apparatus as recited in claim 13 wherein the simulation excludes other portions of the system under test **(page 22 specifically "discard all information older than Tf").**

As per claim 18, Preiss discloses an apparatus as recited in claim 13 wherein the instructions are executed in a second node coupled to the first node **(page 22 specifically "send(i, tf, tmin to lp(j+1) mod n" the 'send' command explicitly defines a coupling).**

As per claim 19, Preiss discloses an apparatus as recited in claim 13 wherein the instructions are executed by the first node **(The instructions are inherently executed by Preiss' system by the node that is reading and writing the model. Specifically, page 06 details the flowchart of the execution on the LP; page 21).**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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20. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
21. Claims 2-5, 21-24, and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Damani et al as applied to the rejection of claim 1 above in view of Smallmo (US Patent 6,289,398 B1).

As per claim 2, Damani does not explicitly teach the limitation, if a first node of the plurality of nodes fails during the simulation, the distributed simulation system is configured to establish a second node, and wherein a third node of the plurality of nodes is configured to read message packets that were transmitted to the first node from the log file and to transmit the message packets to the second node. However, Smallmo teaches that data logged/stored on a failed node shall be rebuild on a spare new node, wherein such new node will replace the failed node **(column 15, lines 52-56)**. Therefore, it would have been obvious to one of ordinary skill in the art to build a distributed computing environment such as that taught by Damani with the mentioned attributes. Smallmo's teachings would have allowed users of Damani's system to enjoy increased stability, fault-tolerance and availability of the distributed network.

As per claim 3, Damani discloses a distributed simulation system as recited in claim 2 wherein the distributed simulation system is configured to pause the simulation prior to transmitting the message packets to the second node **(section 1, lines 1-5)**, and wherein one of the plurality of nodes is configured to resume the simulation subsequent to transmitting the message packets from the log file to the second node **(section 1, column 2, lines 23-26)**.

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Damani teaches that at the time of the failure the system will: halt/pause, recover from the failure, then restart/resume operations.

As per claim 4, Smallmo teaches of a distributed system wherein a warm spare, second node, is configured to detect data, message packets, in a log file which were sourced by a failed device, first node, wherein the warm spare is further configured to verify that the warm spare transmits the failed device's message packets (column 15: lines 65-67, column 16: lines 1-14, lines 16-22).

As per claim 5, Damani disclose a distributed simulation system as recited in claim 2 wherein

the second node is configured to load a simulator state corresponding to a simulation checkpoint (section 2, paragraph 2, lines 3-5),

and wherein the third node is configured to transmit, to the second node, message packets that were transmitted to the first node if the message packets occurred after the simulation checkpoint (section 2, paragraph 2, lines 3-5),

and wherein the third node is configured not to transmit, to the second node, message packets that were transmitted to the first node if the message packets occurred prior to the simulation check point (section 2, paragraph 2, lines 3-5).

As per claims 21-24, and 32-35, note the rejection of claims 2-5 above. The Instant claims are functionally equivalent to the above-rejected claims and are therefore rejected under same prior-art teachings.

22. Claims 1, 20, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Preiss's

"The Yaddes Distributed Discrete Event Simulation Specification Language and Execution Environments", ("Preiss").

As per claim 1, Preiss discloses a distributed simulation system having two or more computer systems operating as nodes performing a simulation of a system under test (**page 07, specifically, LPs**). Further, Preiss discloses that the nodes communicate simulation commands and signal values for the system under test using message packets transmitted (**page 20, specifically "to other processors" and "from other processors"; page 07 "connection**

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specifications – link LPs”; page 21 “envelope” ... message packet). And, Priess also discloses that least one logging node is separate from nodes targeted by the message packets **(page 20. specifically “to other processors” and “from other processors”).** Priess however does not specifically disclose that the files are stored on at least one non-volatile storage medium. Official notice is taken with respect to this claim limitation. It would have been obvious to one of ordinary skill in the art at the time of Applicants’ invention to combine have save the data to a stable storage in order to achieve the many benefits of having stable storage, which are known in the art. Benefits including the ability to synchronize data flow and have stable storage means.

As per claims 20, 31, note the rejection of claims 1 above. The Instant claims are functionally equivalent to the above-rejected claims and are therefore rejected under same prior-art teachings.

23. Claims 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Damani et al as applied to the rejection of claim 20 above in view of ANL “Modular Design Review”.

As per claim 29, Damani discloses all limitations of claim 20. Damani discloses transmitting the packets to the first node (as above rejected). Damani however does not specifically disclose read message packets from a log file that were transmitted during a the simulation of a first portion of a system under test of a particular portion of a system under test, excluding other portions of the system under test. ANL however discloses an analogous system having the said features **(page 1 paragraph 1, 4; page 2 last three lines).** It would have been obvious to one of ordinary skill in the art <programming / modular design> at the time of Applicant’s invention to combine the teachings of the two references in order to facilitate code reusability **(ANL page 3 middle paragraph, page 1 paragraph 2)** and faster reduce the time required to perform a project therefore save time and money.

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24. Claims 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Damani et al as applied to the rejection of claim 20 above in view of THFRC's "Developing a Verifiable System".

As per claim 30, Damani discloses all limitations of claim 20. Damani however does not specifically disclose reading message packets that were transmitted during a prior simulation of a portion of a system under test which exclude other portions of the system under test and further verifying the transition of such packets in the following simulation. THFRC however discloses an analogous system having the said features (**page 6 highlighted middle paragraph**). It would have been obvious to one of ordinary skill in the art <programming / modular design> at the time of Applicant's invention to combine the teachings of the two references in order to allow for testing of the developed system (**THFRC page 6 highlighted middle paragraph**) and faster time to market times.

Conclusion

All claims presented for reconsideration have been rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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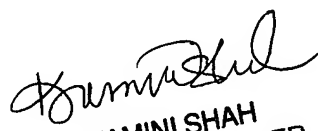
Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Silver whose telephone number is (571) 272-8634. The examiner can normally be reached on Monday thru Friday, 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Silver
Examiner
Art Unit 2128

ds


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PRIMARY EXAMINER
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